

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

REC'D 24 JUL 2001

WIPO

PCT

14

Applicant's or agent's file reference 10026401at	FOR FURTHER ACTION	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416).
International Application No. PCT/AU00/01009	International Filing Date (<i>day/month/year</i>) 25 August 2000	Priority Date (<i>day/month/year</i>) 27 August 1999
International Patent Classification (IPC) or national classification and IPC Int. Cl. ⁷ A01N 65/00, 37/02, C05G 3/02		
Applicant GLOBAL SPILL CONTROL PTY. LIMITED et al		

1.	This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2.	This REPORT consists of a total of 5 sheets, including this cover sheet. <input type="checkbox"/> This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT). These annexes consist of a total of sheet(s).
3.	This report contains indications relating to the following items: I <input checked="" type="checkbox"/> Basis of the report II <input type="checkbox"/> Priority III <input type="checkbox"/> Non-establishment of opinion with regard to novelty, inventive step and industrial applicability IV <input type="checkbox"/> Lack of unity of invention V <input checked="" type="checkbox"/> Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement VI <input type="checkbox"/> Certain documents cited VII <input type="checkbox"/> Certain defects in the international application VIII <input checked="" type="checkbox"/> Certain observations on the international application

Date of submission of the demand 7 March 2001	Date of completion of the report 12 July 2001
Name and mailing address of the IPEA/AU AUSTRALIAN PATENT OFFICE PO BOX 200, WODEN ACT 2606, AUSTRALIA E-mail address: pct@ipaaustralia.gov.au Facsimile No. (02) 6285 3929	Authorized Officer DAVID HENNESSY Telephone No. (02) 6283 2255

I. Basis of the report**1. With regard to the elements of the international application:***

- ☒ the international application as originally filed.
- ☐ the description, pages , as originally filed,
 pages , filed with the demand,
 pages , received on with the letter of
- ☐ the claims, pages , as originally filed,
 pages , as amended (together with any statement) under Article 19,
 pages , filed with the demand,
 pages , received on with the letter of
- ☐ the drawings, pages , as originally filed,
 pages , filed with the demand,
 pages , received on with the letter of
- ☐ the sequence listing part of the description:
 pages , as originally filed
 pages , filed with the demand
 pages , received on with the letter of

2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language which is:

- ☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of the translation furnished for the purposes of international preliminary examination (under Rules 55.2 and/or 55.3).

3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

4. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages
- ☐ the claims, Nos.
- ☐ the drawings, sheets/fig.

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).**

* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17).

** Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**1. Statement**

Novelty (N)	Claims 4-10	YES
	Claims 1-3, 11-16	NO
Inventive step (IS)	Claims 6-10	YES
	Claims 1-5, 11-16	NO
Industrial applicability (IA)	Claims 1-16	YES
	Claims	NO

2. Citations and explanations (Rule 70.7)Citations

D1 IL 105109 (Ofer Yaacov) 18.06.96;

D2 Don-Pedro, K.N. (1996) Pestic.Sci., vol. 46, 79-84;

D3 Arena, M.E. et al. (1996) Microbiologie, Aliments, Nutrition, vol. 14(3), 219-226;

D4 AU 59941/90 (BP Chemicals Limited) 31.01.90.

Explanations

Claims 1-5 and 11-14 define mixtures of citrus derived agents (citrosan) and caprylic (octanoic) acid, and methods of treating plants with the mixture. Claims 15-16 further define methods of claims 11-14, wherein micronutrients are added to, or sprayed with, the mixtures of claims 1-5.

Novelty (N): Claims 1-3, 11-16

No citation discloses a combination of citrus derived agents, caprylic acid and micro-nutrients. Consequently the compositions of claims 6-10 are novel.

The nearest prior art, D3 discloses caprylic (octanoic) acid with citric acid is antibacterial. Consequently, claim 1 is not novel over D3.

D4 discloses an ensiling composition containing octanoic (caprylic) acid and dried citrus peel (see page 2, line 26). Consequently claims 1-3 and 11-16 lack novelty over D4.

Inventive Step (IS): Claims 1-5, 11-16

D3 discloses that caprylic acid is antibacterial. D3 also discloses that similar long chain acids, decanoic acid and dodecanoic acid, when combined with orange juice is highly antibacterial. Consequently, claims 1-3 and 11-16 lack an inventive step over D3.

(Continued in the Supplemental Box)

VIII. Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

Lack of Clarity

Claim 3 is not clear, as there is not antecedent for the defined active bioflavanoids in claim 1. Further, the claim defines a method of extraction, contrary to claim 2, to which it is appended.

Claim 6 is not clear, as it is not clear as to which mixture is defined in the claim.

Claim 8 is unclear. It is incorrectly appended to claim 3.

Claim 16 is not clear, as there is no clear antecedent for 'the mixture including the micronutrient' in the method of claim 15.

The description and the drawings are not clear. The term 'micro-nutrient' is imprecise, and may refer to contaminants found under normal conditions.

Supplemental Box

(To be used when the space in any of the preceding boxes is not sufficient)

Continuation of V.**Inventive Step (IS): Claims 1-5, 11-16**

D1 discloses a synergistic insecticidal composition containing essential oils of citrus fruit peel and an alkanolic acid. Consequently claims 1-5 and 11-16 lack an inventive step over D1, as an analogous use, or in combination with D3.

D2 discloses the insecticidal properties of citrus peel oil components. In combination with D3, the citation renders non-inventive the matter of claims 1-5 and 11-16.

D4 discloses silage preservative mixtures containing octanoic acid and citrus peel. Alone, or in combination with D3 or D2, it renders claims 1-5 and 11-16 non-inventive.

Industrial Applicability (IA): Claims 1-16

All claims have industrial applicability.

PATENT COOPERATION TREATY

PCT

From the INTERNATIONAL BUREAU

NOTIFICATION OF THE RECORDING
OF A CHANGE(PCT Rule 92bis.1 and
Administrative Instructions, Section 422)

To:

TATLOCK, Alfred
A Tatlock & Associates
28 Drummond Street
Carlton South, VIC 3053
AUSTRALIE

Date of mailing (day/month/year) 22 November 2001 (22.11.01)	IMPORTANT NOTIFICATION
Applicant's or agent's file reference	
International application No. PCT/AU00/01009	International filing date (day/month/year) 25 August 2000 (25.08.00)

1. The following indications appeared on record concerning:			
<input type="checkbox"/> the applicant	<input type="checkbox"/> the inventor	<input checked="" type="checkbox"/> the agent	<input type="checkbox"/> the common representative
Name and Address TATLOCK, Alfred A Tatlock & Associates 208 Elgin Street Carlton, VIC 3053 Australia		State of Nationality	State of Residence
		Telephone No. 03 9347 9993	
		Facsimile No. 03 9347 9994	
		Teleprinter No.	
2. The International Bureau hereby notifies the applicant that the following change has been recorded concerning:			
<input type="checkbox"/> the person	<input type="checkbox"/> the name	<input checked="" type="checkbox"/> the address	<input type="checkbox"/> the nationality <input type="checkbox"/> the residence
Name and Address TATLOCK, Alfred A Tatlock & Associates 28 Drummond Street Carlton South, VIC 3053 Australia		State of Nationality	State of Residence
		Telephone No. 03 9664 9999	
		Facsimile No. 03 9664 9900	
		Teleprinter No.	
3. Further observations, if necessary:			
4. A copy of this notification has been sent to:			
<input checked="" type="checkbox"/> the receiving Office	<input type="checkbox"/> the designated Offices concerned		
<input type="checkbox"/> the International Searching Authority	<input checked="" type="checkbox"/> the elected Offices concerned		
<input type="checkbox"/> the International Preliminary Examining Authority	<input type="checkbox"/> other:		

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland	Authorized officer N. Wagner
Facsimile No.: (41-22) 740.14.35	Telephone No.: (41-22) 338.83.38

PATENT COOPERATION TREATY

PCT

NOTIFICATION OF ELECTION

(PCT Rule 61.2)

From the INTERNATIONAL BUREAU

To:

Commissioner
US Department of Commerce
United States Patent and Trademark
Office, PCT
2011 South Clark Place Room
CP2/5C24
Arlington, VA 22202
ETATS-UNIS D'AMERIQUE
in its capacity as elected Office

Date of mailing (day/month/year) 15 May 2001 (15.05.01)	
International application No. PCT/AU00/01009	Applicant's or agent's file reference
International filing date (day/month/year) 25 August 2000 (25.08.00)	Priority date (day/month/year) 27 August 1999 (27.08.99)
Applicant WATSON, Robert, John et al	

1. The designated Office is hereby notified of its election made:

☒ in the demand filed with the International Preliminary Examining Authority on:
07 March 2001 (07.03.01)

☐ in a notice effecting later election filed with the International Bureau on:

2. The election ☒ was
☐ was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No.: (41-22) 740.14.35	Authorized officer Charlotte ENGER Telephone No.: (41-22) 338.83.38
---	---

PATENT COOPERATION TREATY

PCT

From the INTERNATIONAL BUREAU

NOTIFICATION RELATING TO PRIORITY CLAIM

(PCT Rules 26bis.1 and 26bis.2 and
Administrative Instructions, Sections 402 and 409)

To:

TATLOCK, Alfred
A Tatlock & Associates
208 Elgin Street
Carlton, VIC 3053
AUSTRALIE

Date of mailing (day/month/year) 12 January 2001 (12.01.01)	
Applicant's or agent's file reference	IMPORTANT NOTIFICATION
International application No. PCT/AU00/01009	International filing date (day/month/year) 25 August 2000 (25.08.00)
Applicant GLOBAL SPILL CONTROL PTY. LIMITED et al	

The applicant is hereby notified of the following in respect of the priority claim(s) made in the international application.

1. ☒ **Correction of priority claim.** In accordance with the applicant's notice received on: 20 November 2000 (20.11.00), the following priority claim has been corrected to read as follows:
AU 27 August 1999 (27.08.99) PQ 2483
 - ☐ even though the indication of the number of the earlier application is missing.
 - ☐ even though the following indication in the priority claim is not the same as the corresponding indication appearing in the priority document:
2. ☐ **Addition of priority claim.** In accordance with the applicant's notice received on: , the following priority claim has been added:
 - ☐ even though the indication of the number of the earlier application is missing.
 - ☐ even though the following indication in the priority claim is not the same as the corresponding indication appearing in the priority document:
3. ☐ As a result of the correction and/or addition of (a) priority claim(s) under items 1 and/or 2, the (earliest) priority date is:
4. ☐ **Priority claim considered not to have been made.**
 - ☐ The applicant failed to respond to the Invitation under Rule 26bis.2(a) (Form PCT/IB/316) within the prescribed time limit.
 - ☐ The applicant's notice was received after the expiration of the prescribed time limit under Rule 26bis.1(a).
 - ☐ The applicant's notice failed to correct the priority claim so as to comply with the requirements of Rule 4.10.

The applicant may, before the technical preparations for international publication have been completed and subject to the payment of a fee, request the International Bureau to publish, together with the international application, information concerning the priority claim. See Rule 26bis.2(c) and the PCT Applicant's Guide, Volume I, Annex B2(1B).
5. ☐ In case where multiple priorities have been claimed, the above item(s) relate to the following priority claim(s):
6. A copy of this notification has been sent to the receiving Office and
 - ☐ to the International Searching Authority (where the international search report has not yet been issued).
 - ☒ the designated Offices (which have already been notified of the receipt of the record copy).

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No. (41-22) 740.14.35	Authorized officer N. Wagner Telephone No. (41-22) 338.83.38
--	--

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau(43) International Publication Date
8 March 2001 (08.03.2001)

PCT

(10) International Publication Number
WO 01/15536 A1

- (51) International Patent Classification⁷: A01N 65/00, 37/02, C05G 3/02
- (21) International Application Number: PCT/AU00/01009
- (22) International Filing Date: 25 August 2000 (25.08.2000)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:
PQ 2483 27 August 1999 (27.08.1999) AU
- (71) Applicant (for all designated States except US): GLOBAL SPILL CONTROL PTY. LIMITED [AU/AU]; 16 Hasley Road, Airport West, Victoria 3042 (AU).
- (72) Inventors; and
- (75) Inventors/Applicants (for US only): WATSON, Robert, John [AU/AU]; 73 Stintons Road, Park Orchards, Victoria 3114 (AU). GOODING, Matthew, Lenno [US/US]; 1689 South County Road 15, Tiffin, OH 44883 (US). KOTULA, Henry, Joseph [AU/AU]; 5 Maitland Rise, Woodvale, W.A. 6026 (AU).
- (74) Agent: TATLOCK, Alfred; A Tatlock & Associates, 208 Elgin Street, Carlton, VIC 3053 (AU).
- (81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW.
- (84) Designated States (regional): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

Published:

— With international search report.

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

WO 01/15536 A1

(54) Title: PLANT AND PRODUCT TREATMENT

(57) Abstract: The invention relates to a mixture of a citrus agent which contains bioflavonoids and caprylic acid which act synergistically to treat plants to provide anti-bacterial and anti-fungal protection to the plants. The invention also provides the use of this mixture together with a micro-nutrient to generally stimulate plant growth whilst at the same time providing protection. The invention also provides methods of treating plants with the mixtures set out above.

WO 01/15536

PCT/AU00/01009

-1-

PLANT AND PRODUCT TREATMENT

This invention relates to a plant and product treatment and in particular to a treatment which acts as an anti-mildew and anti-fungal spray which also has anti-bacterial properties. The invention also provides, in association with such treatment a
5 synergistic treatment which encourages growth of plants.

Historically, plants and crops (hereinafter generally referred to as plants) have been treated by the use of traditional agri-chemicals many, of which have been found to have undesirable side-effects. As a result, there has been pressure, mainly from consumers, for a move towards safer and more "natural based" alternatives. This can
10 be attributed to;

A growing global trend towards the reduction of chemical and pesticide use

A push for more "Organic Produce"

Growing public concern's over what goes into our food

15 The introduction of tougher legislation either banning or severely restricting the use of many existing chemicals

Growing public awareness to the effects of prolonged exposure or use of chemicals

20 In Europe, for example, Government's are providing incentives to growers who adopt more desirable practices. This new approach, which is established on a country by country basis, is essentially a move as close as possible towards total organic production.

WO 01/15536

PCT/AU00/01009

-2-

It is known to use, as an anti-bacterial agent, products produced from citrus, specifically oranges, such as a product called Cytrosan (Trade Mark but there are other broadly similar products such as Citrex (Trade Mark)) and which can be considered to be a mixture of bioflavonoids or products made from different citrus fruit such as grapefruit. For convenience, we shall refer to these types of products as citrus agents.

Citrus agents are conventionally made from the residue of juice manufacture, skin, pulp and pips, and this residue is dried and then ground into a powder. If required, the product can be treated to remove the soluble material, largely the bioflavonoids, therefrom leaving the fibre as waste. The treatment to remove the soluble material may be by the use of glycerine in which the bioflavonoids are soluble.

Caprylic acid (which is also known as octanoic acid) is known as an anti-fungal agent.

Both the citrus agents and caprylic acid are quite expensive.

The object of the invention is to provide a new plant and product treatment which has anti-bacterial and anti-fungal actions which have not been achieved by either citrus agents or caprylic acid, and which can also preferably have anti-mildew and anti-viral properties.

We have found that the provision of a mixture of citrus agent and caprylic acid together with carriers, possibly alcohol, surfactant and water, provides a synergistic mixture which gives a better result than the use of either of the compounds alone when used to treat plant materials and plant products.

We have also found that when such a mixture is combined with a micro-nutrient (the use of which is known to assist in plant growth), the growth of plants is substantially enhanced over what would have been expected from each of the treatments alone.

WO 01/15536

PCT/AU00/01009

-3-

In a first aspect, the invention thus includes a synergistic mixture for the treatment of plant and plant products which includes both a citrus agent and caprylic acid.

We have found by using a mixture of the invention we can reduce considerably the quantity of citrus agent needed to give a required end result and use only a small
5 quantity of caprylic acid, which is also expensive, to provide a treatment which is very much cheaper than previously available using these compounds separately to provide the results required.

In a second aspect of the invention, we add to the mixture as described above, a micro-nutrient.

10 The micro-nutrient may come from the class of materials known as NPK's, substances which are a mixture of nitrogen, phosphorus and potassium together with trace elements.

The invention also includes a method of treating plants against bacteria and fungus by spraying these at least once during the growing season with the mixture of a citrus
15 agent and caprylic acid.

Also included in the invention is such a method wherein a micro-nutrient is added to or sprayed with the mixture.

In order that the invention may be more readily understood we shall describe particular embodiments of the invention.

20 In the first embodiment we use a mixture formed as follows:-

citrus agent	30-60%
caprylic acid	10-30%
alcohol	10-30%
surfactant	5-15%

25

WO 01/15536

PCT/AU00/01009

-4-

In a specific mixture which we have used and from which we have had very good results, we use:

	Cytosan (a specific citrus agent)	44%
5	caprylic acid	22%
	alcohol	22%
	surfactant	11%

This product we refer to as Croplife.

10 The mixture for use is diluted and we have found that when it is required for use against Downey and Powdery mildew the dilution can be very high. We have found that between 0.25 and 1.5 ml per litre of the mixture added to make up 100 litres provides a satisfactory dilution and 500 litres of this mixture provides good coverage for one hectare.

15 For golf course fungi we have found a dose rate of one litre of the mixture in 100 litres of water, 10ml/litre, is satisfactory.

For fungi found during mushroom production we use a mixture of 3-4 ml per litre of water.

We have effected field trials in mushrooms, grapes, grasses, apples pears mangos potatoes and tomatoes, all with effective results.

20 We have found that we have had positive results against three specific fungi, *Verticillium fungicola* var. *fungicola* (dry bulb), *Mycogone perniciosa* (wet bulb) and *Cladobotryum dendroides*, formally "*Dactylium dendroides*" (Cobweb), which have developed a mutagenic resistance to conventional fungicides.

The synergistic mixture of the invention satisfactorily killed these fungi.

WO 01/15536

PCT/AU00/01009

-5-

In the vineyards we used the product against the fungus *Botrytis* (*Botrytis cinerea*) and the mildews, Downey Mildew (*Plasmopara viticola*) and Powdery mildew (*Uncinulanecator*) and the product has been successful against these.

The product has been used in grasses and has successfully been used against the following fungi:

Fusarium acuminatari

Brown Spot (*Rhizoctonia*)

Dollar Spot (*Sclerotinia homoeocarpa*)

Fairy Ring (*Agraricales & Gastromycetale*).

Tests against bacteria have also provided satisfactory results and amongst bacterias tested are:

Pseudomonas

Erwinia

Anthraco

These tests have also shown that the product appears to be a systemic, that is that a certain percentage of the product will be taken up by the plant through both the leaves and roots and its effectiveness will be retained for some time.

Not only have we tried the product on the plants and fruit whilst being grown, we also found that the product can also be valuable post-harvest by dipping or spraying the product into a diluted mixture of the product and this has assisted the life of the harvested products. Where the product has been treated in the field before being treated post-harvest, the results have been enhanced.

Practically, we prefer that the product be applied to plants during the cool of the day, and preferably not prior to or just subsequent to rain. As the product is taken up by the leaves, it is better, if it is likely to rain within six hours to apply the product at a later time.

WO 01/15536

PCT/AU00/01009

-6-

Also, we have found that to obtain best results, the product can be sprayed in a light mist and the spray be repeated some five days after the first spray.

If, after a second spray, there is still signs of the infestation, the spraying can be repeated after a further five days.

- 5 We have found that the residues of the product components are not toxic, they are applied in only small quantities, both the citrus agent and the caprylic acid are natural products which are acceptable for use in food and, in any case, because of the low concentrations, the amount of residues is extremely small.

- 10 Whilst in the specification we have described particular certain applications and percentages of components and quantities applied, it is to be understood that these are exemplary of the invention and not restrictive.

- 15 The invention provides a treatment which is cheaper than using high percentage citrus agent as, because of the synergistic effect of the citrus agent and the caprylic acid, the quantity of citrus agent used is greatly reduced and whilst caprylic acid is itself quite expensive, it is used in such small quantities that the overall cost is minimised. There can be changes in the specific citric agent, the alcohol and the surfactant and where such changes are made, the proportions may have to be varied based on empirical information.

- 20 In the second aspect of the invention, we use the product described above together with a micro-nutrient (or nutritional solution).

These micro-nutrients themselves are known and one particular form "Growers" is an NPK product which includes nitrogen, phosphorus and potassium in a 10:20:10 ratio, together with a large number of trace elements. Growers and similar products are known as nutritional solutions. Whilst in the specific examples, we will refer to the

WO 01/15536

PCT/AU00/01009

-7-

use of Growers, it is to be understood that this is an exemplification of a class of known products.

The ratio of the two components can be varied depending on the particular application but, generally we suggest between 5 to 20 ml of Croplife to 1 litre of Growers but these proportions are not limiting.

Some qualitative results of the use of the mixture are as follows:

Apples and Pears - DONNYBROOK

Treated 1 hectare of Packham Pears and 1 Hectare of Royal Gala Apples with three treatments of Croplife and two treatments Growers Spray. Pears from the crop were stored in CA for 6 months with conventional DPA treatment. Product had very little rot and mould.

Potatoes - Ohio USA

Application rate 4 litres Growers/60ml Croplife per acre applied 6 times during season. Resulted in:

Better Sustained Growth.

No disease outbreaks.

Much improved yield.

WO 01/15536

PCT/AU00/01009

-8-

T mat es

This grower was able to compare the trial plot which comprised 4 acres against a traditionally treated plot and neighbouring plots.

5 Application Rate 4 litres Growers + 90ml Croplife per acre applied 4 times in season. Resulted in;

Reduction in traditional fungicides and fumigants.

Reduction in fertiliser used.

Reduction in disease (fungi).

Better product size.

10 Grower said advantage in using Croplife/Growers amounted to saving of USD550/acre over traditional farming with crop as good if not better.

Surrounding blocks under disease pressure.

Tomatoes - Greenhouse

15 Application rate of 2 tablespoons Growers + ¼ oz (7.5 mls) Croplife per 4 litres of water applied weekly. Resulted in;

Significant reduction in incidence of disease.

Better sized and greater volume of produce.

WO 01/15536

PCT/AU00/01009

-9-

Capsicum

Application rate of 4 litres Growers + 90ml Croplife/Acre applied four times per season.

Significant reduction in incidence of disease.

5

Better sustained crop.

Better yield.

Ornamentals - Mum's

10

Application rate of 2 Tablespoons Growers + ¼ oz (7.5mls) Croplife per 4 litres of water weekly.

Plants were essentially disease free.

Much better visible sustained growth.

Superior plant.

15

Soybean

Application rate of 6 litres Growers + 60ml Croplife/Acre every 2 weeks after plants were over 6" tall.

WO 01/15536

PCT/AU00/01009

-10-

Plants were shooting more suckers.

Generally healthier.

Crop loaded.

5

Grapes

Application rate of 4 Litres Growers + 60ml Croplife/Acre applied 4 times during season. Resulted in:

Significant disease reduction.

Healthier looking plant and product.

10

Expect yield increase will follow.

Wheat

Application rate of 12 litres Growers + 60ml Croplife per acre 3 times during season. Resulted in;

15

Dramatic yield increase of 13.5 Bushells/acre.

WO 01/15536

PCT/AU00/01009

-11-

Strawberries

Used as a transplant solution of 60mls Growers + 30ml Croplife per gallon with much improved transplant rate and noticeably more vigorous growth.

5 It can be seen from these results that, generally, not only were the plants healthier than would otherwise be the case but, also, all forms of infestation, bacterial and fungal appear to be controlled. better than by the use of any of the components separately and the final plant was better and stronger than would have been expected to be the case using more conventional agri-chemicals.

WO 01/15536

PCT/AU00/01009

-12-

We claim:

1. A synergistic mixture for the treatment of plant and plant products which includes both a citrus agent and caprylic acid.
2. A mixture as claimed in claim 1 wherein the citrus agent is made from grinding the dried residue of squeezed citrus.
3. A mixture as claimed in claim 2 wherein active bioflavoids are obtained from the ground residue by being dissolved therefrom.
4. A mixture as claimed in any one of claims 1 to 3 wherein the mixture comprises:

citrus agent	30-60%
caprylic acid	10-30%
alcohol	10-30%
surfactant	5-15%
5. A mixture as claimed in claim 4 wherein the mixture comprises:

Cytrosan (a specific citrus agent)	44%
caprylic acid	22%
alcohol	22%
surfactant	11%
6. A mixture as claimed in any preceding claim to which there is added a micro-nutrient.

WO 01/15536

PCT/AU00/01009

-13-

7. A mixture as claimed in claim 6 wherein the micro-nutrient is from the class of materials known as NPK's, substances which are a mixture of nitrogen, phosphorus and potassium together with trace elements.
- 5 8. A mixture as claimed in claim 3 wherein the nitrogen, phosphorus and potassium are in the ratio of 10:20:10.
9. A mixture as claimed in either of claim 7 or claim 8 wherein the micro-nutrient also includes trace elements.
- 10 10. A mixture as claimed in any one of claims 7 to 9 wherein there is of the order of 5 to 20 ml of the product of claims 1 to 6 to one litre of the micro-nutrient of claims 7 to 9.
- 15 11. A method of treating plants against bacteria and fungus by spraying these at least once during the growing season with the mixture of any one of claims 1 to 6.
- 20 12. A method as claimed in claim 11 wherein the mixture is diluted before spraying,
13. A method of claim 12 wherein the dilution lies within the range of 0.25 ml to 1.5 ml per litre of water.
- 25 14. A method as claimed in claim 13 wherein the resultant liquid is sprayed at the rate of the order of 500 litres per hectare.

WO 01/15536**PCT/AU00/01009****-14-**

15. A method as claimed in any one of claims 11 to 14 wherein a micro-nutrient is added to or sprayed with the mixture of any one of claims 1 to 5.
- 5 16. A method as claimed in claim 15 wherein the mixture including the micro-nutrient is as claimed in any one of claims 7 to 10.

INTERNATIONAL PATENT APPLICATION
PCT/AU00/01009

International application No.

PCT/AU00/01009

A. CLASSIFICATION OF SUBJECT MATTER		
Int. Cl. ⁷ : A01N 65/00, 37/02, C05G 3/02		
According to International Patent Classification (IPC) or to both national classification and IPC		
B. FIELDS SEARCHED		
Minimum documentation searched (classification system followed by classification symbols) IPC A01N, C05G		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched		
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) STN CAPLUS WPIL		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X,Y	Esp@cenet (http://ep.espacenet.com/) abstract, IL 105109 (Ofar Yaacov) 18.06.96, title 'Synergistic insecticidal compositions containing essential oils of citrus fruit peel and an alkanolic acid'.	1-5, 11-16
Y	Pestic.Sci., vol.46, 79-84, 1996, Don-Pedro, K.N., Investigation of Single and Joint Fumigant Insecticidal Action of Citruspeel Oil Components.	1-5, 11-16
X,Y	Microbiologie, Aliments, Nutrition, vol. 14(3), 219-226, 1996, Arena, M.E. et al., Inhibition of growth of Lactobacillus Plantarum isolated from citrus fruits in the presence of organic acids.	1-5, 11-16
<input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C <input checked="" type="checkbox"/> See patent family annex		
* Special categories of cited documents: "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier application or patent but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art "&" document member of the same patent family		
Date of the actual completion of the international search 2 November 2000		Date of mailing of the international search report -9 NOV 2000
Name and mailing address of the ISA/AU AUSTRALIAN PATENT OFFICE PO BOX 200, WODEN ACT 2606, AUSTRALIA E-mail address: pct@ipaaustralia.gov.au Facsimile No. (02) 6285 3929		Authorized officer DAVID HENNESSY Telephone No: (02) 6283 2255

INTERNATIONAL SEARCH REPORT

International application No.

PCT/AU00/01009

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	AU 59941/90 A (BP Chemicals Limited) 31.01.90, see the abstract in particular.	1-5, 11-16

INTERNATIONAL SEARCH REPORT
Information on patent family membersInternational application No.
PCT/AU00/01009

This Annex lists the known "A" publication level patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent Document Cited in Search Report				Patent Family Member			
AU	59941/90	CA	2021973	DE	69005224	DK	411827
		EP	411827	ES	2062381	FI	903761
		GB	8927678	IE	64425	JP	3191756
		NO	903325	NZ	234670	PL	286244-
		US	5082675	ZA	9005862		
END OF ANNEX							

PATENT COOPERATION TREATY
PCT
INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 10026401at	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416).	
International Application No. PCT/AU00/01009	International Filing Date (day/month/year) 25 August 2000	Priority Date (day/month/year) 27 August 1999
International Patent Classification (IPC) or national classification and IPC Int. Cl. ⁷ A01N 65/00, 37/02, C05G 3/02		
Applicant GLOBAL SPILL CONTROL PTY. LIMITED et al		

1.	This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.																
2.	<p>This REPORT consists of a total of 5 sheets, including this cover sheet.</p> <p><input type="checkbox"/> This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).</p> <p>These annexes consist of a total of sheet(s).</p>																
3.	<p>This report contains indications relating to the following items:</p> <table style="width: 100%;"> <tr> <td style="width: 5%;">I</td> <td><input checked="" type="checkbox"/> Basis of the report</td> </tr> <tr> <td>II</td> <td><input type="checkbox"/> Priority</td> </tr> <tr> <td>III</td> <td><input type="checkbox"/> Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</td> </tr> <tr> <td>IV</td> <td><input type="checkbox"/> Lack of unity of invention</td> </tr> <tr> <td>V</td> <td><input checked="" type="checkbox"/> Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</td> </tr> <tr> <td>VI</td> <td><input type="checkbox"/> Certain documents cited</td> </tr> <tr> <td>VII</td> <td><input type="checkbox"/> Certain defects in the international application</td> </tr> <tr> <td>VIII</td> <td><input checked="" type="checkbox"/> Certain observations on the international application</td> </tr> </table>	I	<input checked="" type="checkbox"/> Basis of the report	II	<input type="checkbox"/> Priority	III	<input type="checkbox"/> Non-establishment of opinion with regard to novelty, inventive step and industrial applicability	IV	<input type="checkbox"/> Lack of unity of invention	V	<input checked="" type="checkbox"/> Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement	VI	<input type="checkbox"/> Certain documents cited	VII	<input type="checkbox"/> Certain defects in the international application	VIII	<input checked="" type="checkbox"/> Certain observations on the international application
I	<input checked="" type="checkbox"/> Basis of the report																
II	<input type="checkbox"/> Priority																
III	<input type="checkbox"/> Non-establishment of opinion with regard to novelty, inventive step and industrial applicability																
IV	<input type="checkbox"/> Lack of unity of invention																
V	<input checked="" type="checkbox"/> Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement																
VI	<input type="checkbox"/> Certain documents cited																
VII	<input type="checkbox"/> Certain defects in the international application																
VIII	<input checked="" type="checkbox"/> Certain observations on the international application																

Date of submission of the demand 7 March 2001	Date of completion of the report 12 July 2001
Name and mailing address of the IPEA/AU AUSTRALIAN PATENT OFFICE PO BOX 200, WODEN ACT 2606, AUSTRALIA E-mail address: pct@ipaustalia.gov.au Facsimile No. (02) 6285 3929	Authorized Officer DAVID HENNESSY Telephone No. (02) 6283 2255

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/AU00/01009

I. Basis of the report

1. With regard to the elements of the international application:*
- ☒ the international application as originally filed.
- ☐ the description, pages , as originally filed,
pages , filed with the demand,
pages , received on with the letter of
- ☐ the claims, pages , as originally filed,
pages , as amended (together with any statement) under Article 19,
pages , filed with the demand,
pages , received on with the letter of
- ☐ the drawings, pages , as originally filed,
pages , filed with the demand,
pages , received on with the letter of
- ☐ the sequence listing part of the description:
pages , as originally filed
pages , filed with the demand
pages , received on with the letter of
2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.
These elements were available or furnished to this Authority in the following language which is:
- ☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of the translation furnished for the purposes of international preliminary examination (under Rules 55.2 and/or 55.3).
3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:
- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished
4. ☐ The amendments have resulted in the cancellation of:
- ☐ the description, pages
- ☐ the claims, Nos.
- ☐ the drawings, sheets/fig.
5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).**

* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17).

** Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/AU00/01009

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**1. Statement**

Novelty (N)	Claims 4-10	YES
	Claims 1-3, 11-16	NO
Inventive step (IS)	Claims 6-10	YES
	Claims 1-5, 11-16	NO
Industrial applicability (IA)	Claims 1-16	YES
	Claims	NO

2. Citations and explanations (Rule 70.7)Citations

D1 IL 105109 (Ofer Yaacov) 18.06.96;

D2 Don-Pedro, K.N. (1996) Pestic.Sci., vol. 46, 79-84;

D3 Arena, M.E. et al. (1996) Microbiologie, Aliments, Nutrition, vol. 14(3), 219-226;

D4 AU 59941/90 (BP Chemicals Limited) 31.01.90.

Explanations

Claims 1-5 and 11-14 define mixtures of citrus derived agents (citrosan) and caprylic (octanoic) acid, and methods of treating plants with the mixture. Claims 15-16 further define methods of claims 11-14, wherein micronutrients are added to, or sprayed with, the mixtures of claims 1-5.

Novelty (N): Claims 1-3, 11-16

No citation discloses a combination of citrus derived agents, caprylic acid and micro-nutrients. Consequently the compositions of claims 6-10 are novel.

The nearest prior art, D3 discloses caprylic (octanoic) acid with citric acid is antibacterial. Consequently, claim 1 is not novel over D3.

D4 discloses an ensiling composition containing octanoic (caprylic) acid and dried citrus peel (see page 2, line 26). Consequently claims 1-3 and 11-16 lack novelty over D4.

Inventive Step (IS): Claims 1-5, 11-16

D3 discloses that caprylic acid is antibacterial. D3 also discloses that similar long chain acids, decanoic acid and dodecanoic acid, when combined with orange juice is highly antibacterial. Consequently, claims 1-3 and 11-16 lack an inventive step over D3.

(Continued in the Supplemental Box)

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/AU00/01009

VIII. Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

Lack of Clarity

Claim 3 is not clear, as there is not antecedent for the defined active bioflavonoids in claim 1. Further, the claim defines a method of extraction, contrary to claim 2, to which it is appended.

Claim 6 is not clear, as it is not clear as to which mixture is defined in the claim.

Claim 8 is unclear. It is incorrectly appended to claim 3.

Claim 16 is not clear, as there is no clear antecedent for 'the mixture including the micronutrient' in the method of claim 15.

The description and the drawings are not clear. The term 'micro-nutrient' is imprecise, and may refer to contaminants found under normal conditions.

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/AU00/01009

Supplemental Box

(To be used when the space in any of the preceding boxes is not sufficient)

Continuation of V.

Inventive Step (IS): Claims 1-5, 11-16

D1 discloses a synergistic insecticidal composition containing essential oils of citrus fruit peel and an alkanolic acid. Consequently claims 1-5 and 11-16 lack an inventive step over D1, as an analogous use, or in combination with D3.

D2 discloses the insecticidal properties of citrus peel oil components. In combination with D3, the citation renders non-inventive the matter of claims 1-5 and 11-16.

D4 discloses silage preservative mixtures containing octanoic acid and citrus peel. Alone, or in combination with D3 or D2, it renders claims 1-5 and 11-16 non-inventive.

Industrial Applicability (IA): Claims 1-16

All claims have industrial applicability.